

## Claims

1. In an aeration plant having a suspension feed inlet, a process for removing particulate impurities from a feed flow suspension of recoverable solids by passing the feed as an impure fluid flow through an impurities flotation stage, collecting and discharging the flotated impurities through an overflow line, and discharging the purified suspension through an accepts line, wherein the flotation stage has at least one cell with an internal flow loop for processing a portion of said impure fluid within said cell, and wherein the improvement comprises removing some of said impurities by washing at least a portion of said impure fluid flow.

2. Process according to Claim 1, wherein the washing is performed in the internal loop of said cell.

3. Process according to Claim 2, wherein the internal loop mixes air with a portion of said impure fluid flow for aeration injection into said cell.

4. Process according to Claim 1, wherein the plant has at least one primary flotation stage and at least one secondary flotation stage, and the washing is interposed between the primary and secondary stages.

5. Process according to Claim 1, wherein the plant has a plurality of primary flotation cells and at least one secondary flotation cell and the washing is associated with each of two of the primary cells.

6. Process according to Claim 1, wherein the plant has a plurality of primary flotation cells and at least one secondary flotation cell

and the washing is associated with at least one primary cell and is also interposed between the primary stage and the secondary stage.

7. Process according to Claim 1, wherein the plant has a plurality of primary flotation cells and a plurality of secondary flotation cells and the washing is associated with each of two primary cells and each of two secondary cells.

8. Process according to Claim 4, wherein the solids suspension is diluted to a consistency of some 0.6 – 1.4%, particularly 0.8 – 1.3%, before entering the secondary stage.

9. Process according to Claim 1, wherein the plant has a plurality of flotation cells and the washing is interposed into the loop of each of at least two cells.

10. Process according to Claim 9, wherein the washing at two of said cells produces respective cleaned flows and reject flows, and both clean flows are delivered to a further washing process.

11. Process according to Claim 9, wherein the washing at two of said cells produces respective cleaned flows and reject flows, and both reject flows are delivered to a further washing process.

12. Process according to Claim 9, wherein said two washing processes are interposed into the loops of primary cells.

13. Process according to Claim 1, wherein the accept from the entire process has an ash content of less than approximately 20%, preferably below 15%, at an inlet feed filler content of at least about 23%.

14. Process according to Claim 3, wherein the plant has a plurality of primary flotation cells and at least one secondary flotation cell and the washing is interposed in the loop of each of two primary cells.

5           15. Process according to Claim 3, wherein the plant has a plurality of flotation cells and the washing is interposed into the loop of each of at least two of said cells.

10           16. Process according to Claim 15, wherein the washing at two of said cells produces respective cleaned flows and reject flows, and both cleaned flows are delivered to a further washing process.

15           17. Process according to Claim 15, wherein the washing at two of said cells produces respective cleaned flows and reject flows, and both clean and reject flows are delivered to a further washing process.

20           18. In a process for deinking a pulp suspension by passing the suspension through a series of flotation cells to remove impurities, the improvement comprising diverting at least a portion of the suspension from a cell, washing impurities from the diverted suspension, and returning the washed suspension to a cell.

25           19. An aeration plant having a suspension feed inlet, means for removing particulate impurities from a feed suspension of recoverable solids by passing the feed as an impure fluid flow through at least one impurities flotation stage, means for collecting and discharging the flotated impurities through an overflow line, and means for discharging the purified suspension through an accepts line, wherein the improvement further comprises a washer for removing some of the  
30           impurities in at least a portion of the impure fluid flow.

20. In an aeration plant having a suspension feed inlet, means for removing particulate impurities from a feed suspension of recoverable solids by passing the feed as an impure fluid flow through at least one impurities flotation stage, means for collecting and discharging the  
5 flotated impurities through an overflow line, and means for discharging the purified suspension through an accepts line, wherein each flotation stage has an internal flow loop for mixing air from an air line with a portion of said impure fluid flow in a liquid line, for aeration injection into said stage, wherein the improvement further comprises a washer for  
10 removing some of said impurities in at least a portion of said impure fluid.

21. Plant according to Claim 20, wherein said floatation stage has a plurality of cells having a said internal flow loop and wherein the washer is interposed in the liquid loop of at least one cell.

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22. Plant according to Claim 20, wherein the plant has primary and secondary stages and the washer is interposed between the primary and secondary stages.

20 23. Plant according to Claim 22, including a dilution water pipe flowing in between the washer and the secondary stage.

24. Plant according to Claim 21, wherein a washer is interposed in the loop of each of two cells.

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25. Plant according to Claim 24, wherein the accept flows from the two washers are fed together to a further washer.

26. Plant according to Claim 24, wherein the reject flows from  
30 the two washers are fed together to a further washer.

27. Plant according to Claim 24, wherein the two washers are interposed into the loops of primary cells.

28. Plant according to Claim 20, wherein the washer is a  
5 rotation washer with vertical rotor axis.

29. Plant according to Claim 20, wherein the washer is a roll washer.